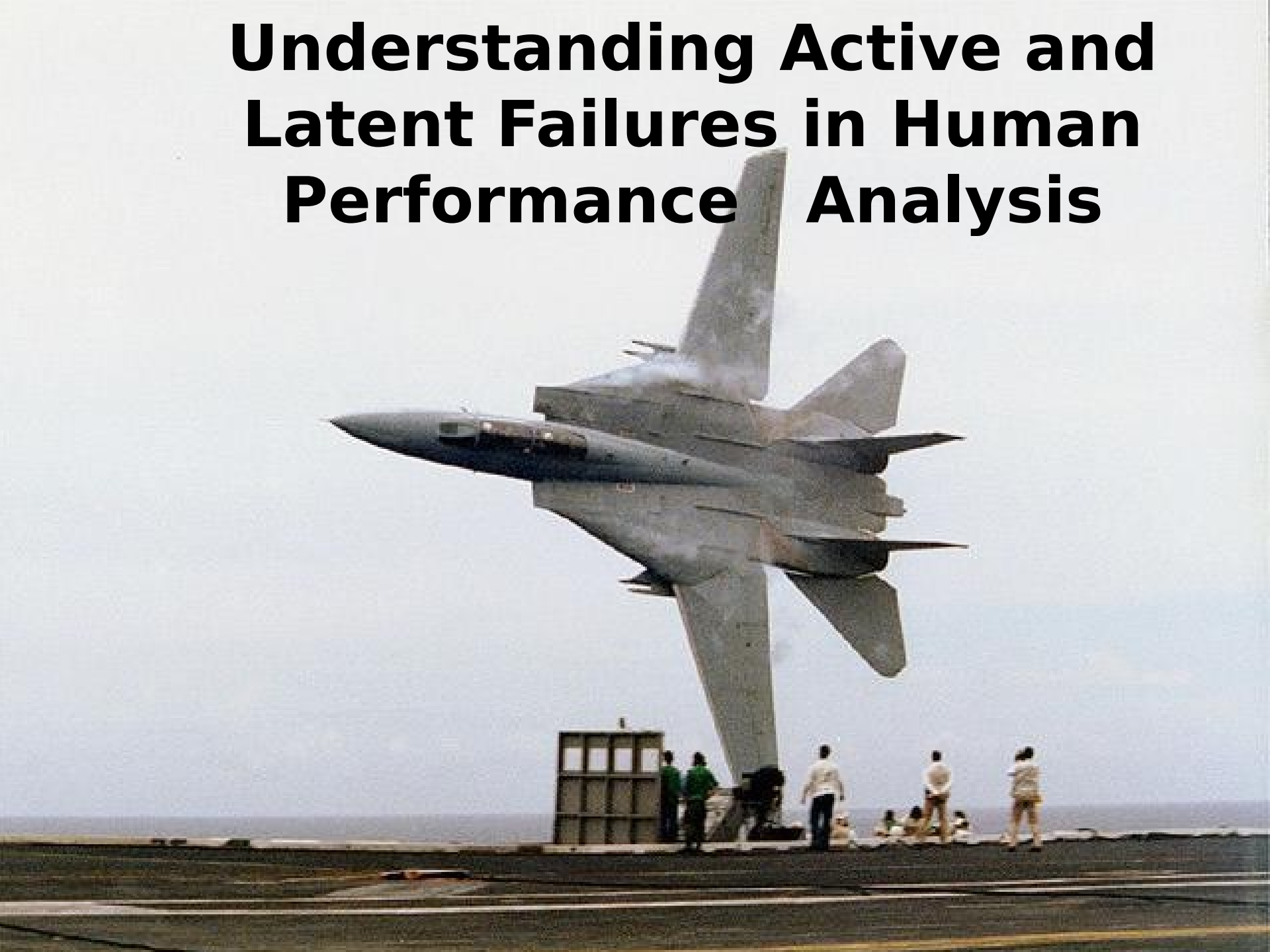
Understanding Active and Latent Failures in Human Performance Analysis



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OBJECTIVES

- Understand To Err is Human
- Understand Human Error Does Not Take Place in a Vacuum
- Understand Human Error in the Context of Performance Levels
- Explain the Role, Cause and Detection of Human Error

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METHODOLOGY

- Explain Reason's Human Error Model
- Discuss Active and Latent Failures in Relation to USAF Human Factor Taxonomy

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FAILURE TYPES

- **Active Failures** – Committed by Those in Direct Contact with System
- **Latent Failures** – Derived from Decisions made at Management and Organizational Levels

ACTIVE FAILURES AND PERFORMANCE

- Skill-Based Performance
- Rule-Based Performance
- Knowledge-Based Performance

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PERFORMANCE CLASSIFICATION

- Skill Based
  - Routine, Highly Practiced Tasks
  - Near Automatic Response

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PERFORMANCE CLASSIFICATION

- Rule Based
  - Misclassify Situations – Wrong Rule Applied
  - Follows “If XX Situation Then XX Action”

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PERFORMANCE CLASSIFICATION

- Knowledge Based
  - Can’t Find Solution
  - Slow, Effortful, High Error Opportunity

PERFORMANCE, ERROR AND VIOLATION

Performance	Error	Violation
Skill-Based	Failure of execution Failure of plan	Routine
Rule-Based	Rule-based mistakes	Situational
Knowledge-Based	Knowledge-based mistakes	Exceptional

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PERFORMANCE, ERROR AND VIOLATION

Performance	Error	Violation
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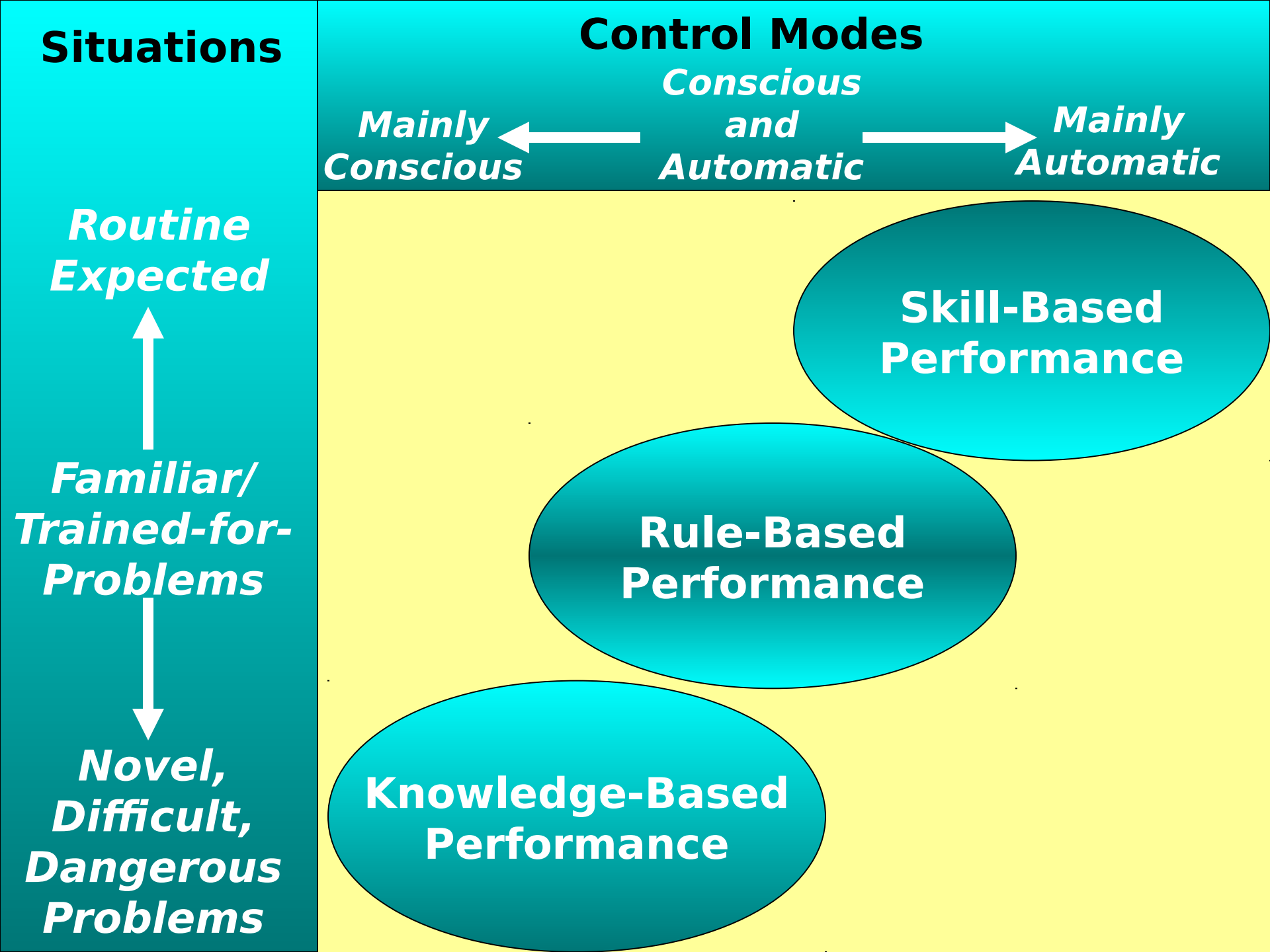
ERRORS AND VIOLATIONS

ERROR	VIOLATION
• Unintended	• Deliberate
• Informational	• Motivational
• Individual	• Social
• Improve Information	• Motivational Remedies


Situations
Routine
Expected
Familiar/
Trained-for-
Problems
Novel,
Difficult,
Dangerous
Problems
Control Modes
Mainly
Conscious
Conscious
and
Automatic
Mainly
Automatic
Skill-Based
Performance
Rule-Based
Performance
Knowledge-Based
Performance

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INDIVIDUAL OR ORGANIZATIONAL ERRORS

- Moral Dimension
  - Blame, Responsibility and Legal Liability
- Scientific Dimension
  - Cause and Effect in Chain of Events
- Practical Dimension
  - Most Effective Countermeasures

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MORAL DIMENSION

- Pin Legal Responsibility on Individual
- Professionals Expected to Accept Responsibility
- Individuals Chose Error-Prone Actions
- Disastrous Outcomes Equal Monstrous Blunders
- Blame Someone Rather Than Something

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SCIENTIFIC DIMENSION

- Everything Has a Prior Cause
- Identify Causal Factors
- Mishap is Convergence of Causal Chains

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REMEDIAL DIMENSION

- Can Latent Organizational and Managerial Factors be Identified Before a Mishap Occurs?
- Can this Leadership Intervention Mitigate Local Mishap-Producing Factors?

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BOTTOM LINE

- Only Investigating and Addressing the Individual Error (Active) Components of Mishap Chain of Events Fails to Determine the Underlying (Latent) Conditions Allowing the Individual Error to Occur…

But

Humans **WILL** Commit Errors!

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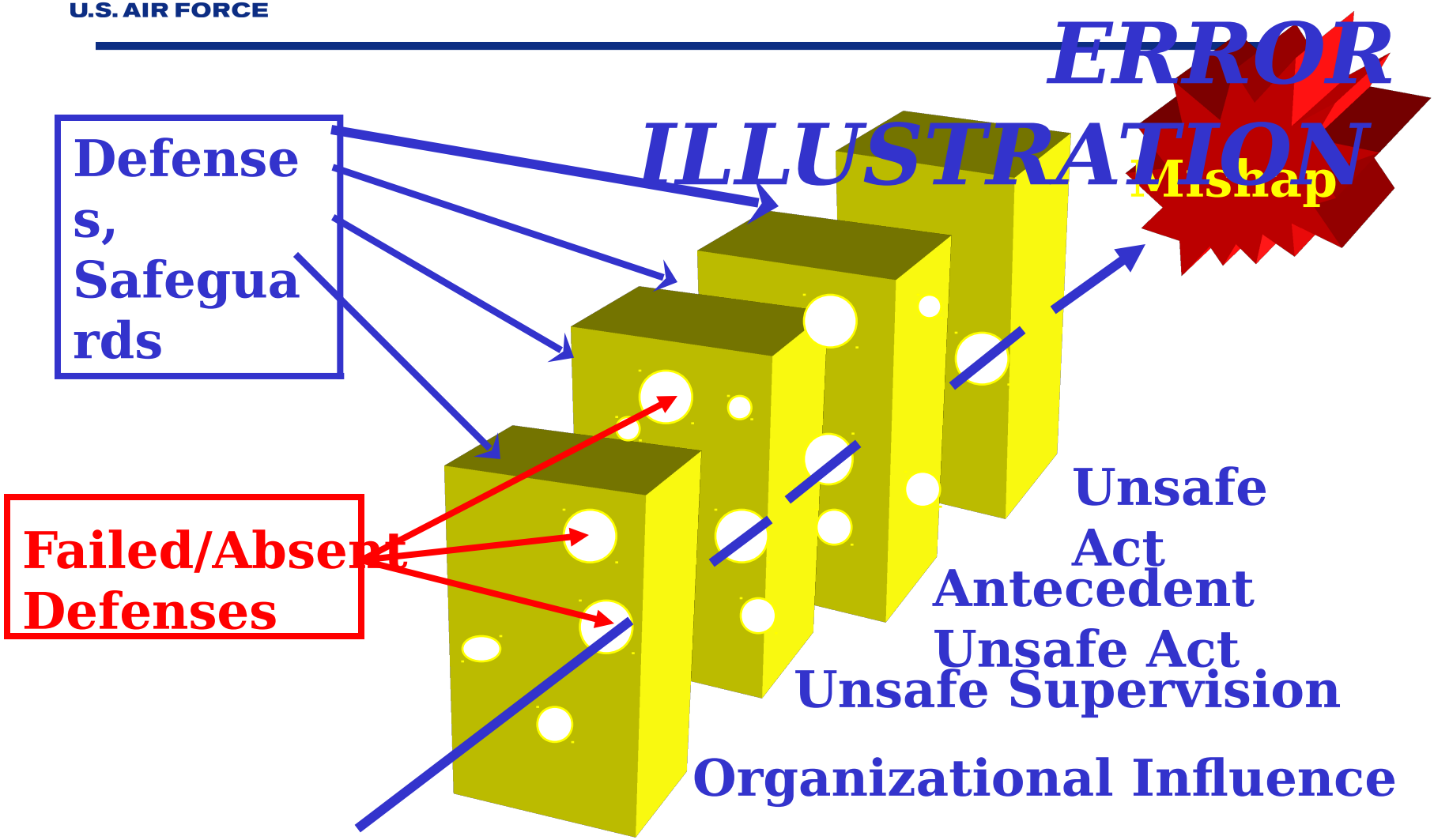
REASON'S HUMAN ERROR ILLUSTRATION



A-10 MISHAP

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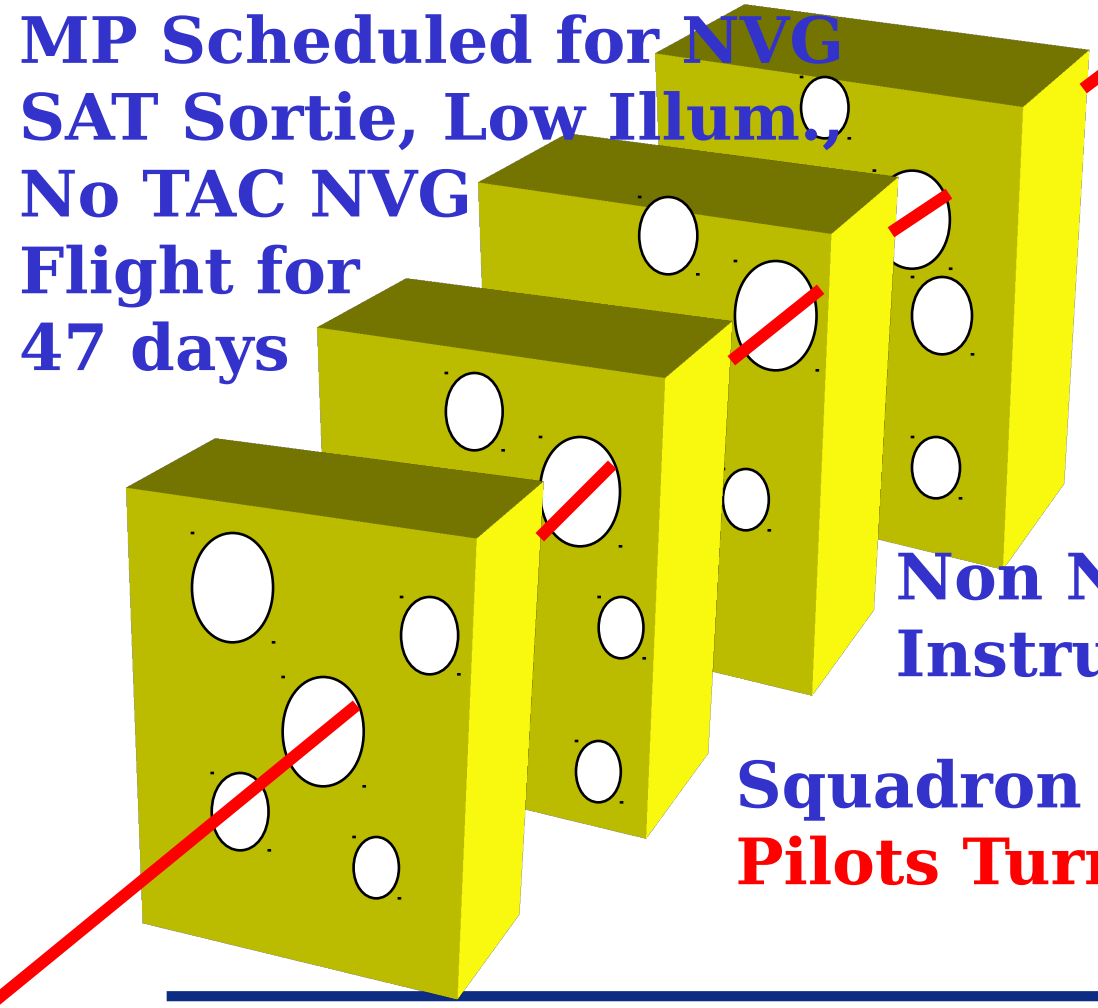
Air score Bomb
SDO, Unal
to Rec
CFIT

Mishap

MP Scheduled for NVG
SAT Sortie, Low Illum.,
No TAC NVG
Flight for
47 days

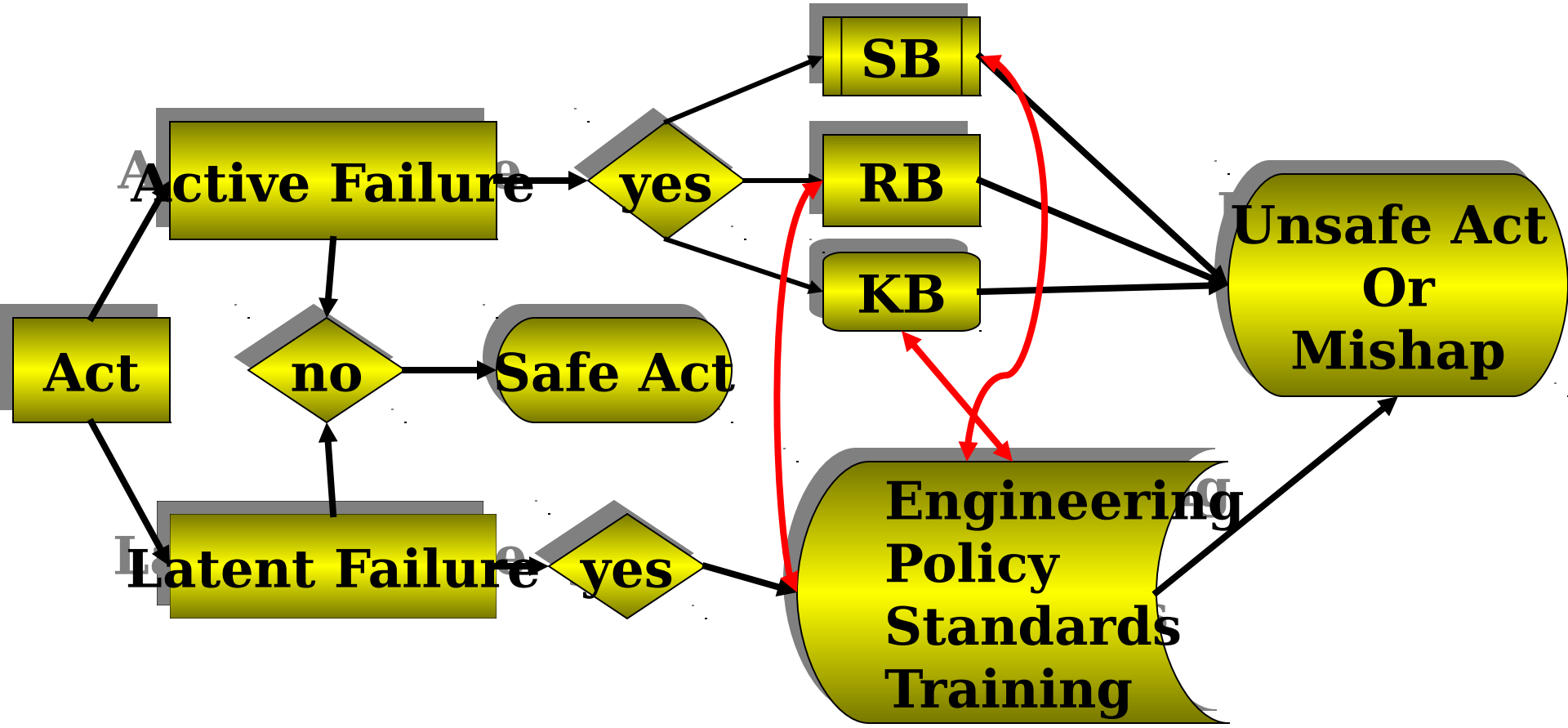


Plans/Tactics Employ
MDS w/NVG: Not
Enough NVIS, Mods/Sp

Non NVIS Lighting on Flight
Instruments: Filters used Ins

Squadron Developed “Work Arou
Pilots Turned Down Instrument I

REASON'S MODEL IN SUMMARY



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QUESTIONS?